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ABSTRACT

The choice of time lag between variables can affect surveys of public opinion and audience behavior, according to this report on the effects of media coverage of the controversy surrounding the operation of the supersonic transport Concorde out of Dulles Airport, near Washington, D.C. Five theories of media effects are outlined, including direct effects, indirect effects, reverse effects, agenda setting, reverse agenda setting, and reinforcement effects. Two major techniques for collection of media and audience data--multiple wave and continuous time measurement--are discussed and contrasted in this study of public reaction to a major controversy. Multiple wave data collection is described as taking place at a relatively small number of time points, usually separated by fairly long time periods; continuous time measurement is described as taking place over the duration of a study at a large number of time points. Results indicated that the multiple wave technique of data collection gives no indication of the effect that media has on public opinion or audience behavior, and that the continuous data collection technique reveals that the media had only an initial effect on public opinion. (AEA)

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MEDIA COVERAGE IN A COMMUNITY CONTROVERSY: INITIAL AND SUBSEQUENT EFFECTS

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MEDIA COVERAGE IN A COMMUNITY CONTROVERSY: INITIAL AND SUBSEQUENT EFFECTS

There is a general and growing consensus among communication researchers that time as a concept must be included in communication research efforts (cf. Kline, 1977), if theoretical models of communication are ever to reach a state of development at which they can adequately describe media effects. It is hard to find anyone who would take issue with this statement, and currently some are even putting it into practice (Zucker, 1978; Krull and Husson, 1979; Krull and Paulson, 1977, Danowski and Cutler, 1977) But introducing time in a field which has previously relied almost exclusively on the study of static relationships brings with it some new methodological and theoretical problems.

One possibility which comes from studying mass communication processes over time is the possibility that the relationships between media coverage and audience behavior observed at one time point will not hold at another. Zucker (1978) has proposed that news media influence is variable according to the "obtrusiveness" (the audience's direct experience) of the issue being reported upon and also according to the length of time the issue has been prominent in the media. His secondary analysis of public opinion polls and media coverage of several issues over a number of years supported the idea that the prominence of media coverage preceeded in time the perception by the public of the importance of the

issue, but only when the issue was unobtrusive, i.e., when the audience did not have direct experience with manifestations of the issue. Further, he found that media effects for unobtrusive issues fell off after a time.

The decrease in media effects over time for issues which do not directly affect audience members, and the lack of a media leadership effect for issues which do affect audience members, can be explained by the concept of "accumulated information". Saltiel and Woelfel (1975) propose an attitude formation theory which states that an attitude is formed as the average of the evaluative valence of all information received about the attitude object. If relatively little information is known about an object, subsequent messages will have a strong effect, assuming they are discrepant with previous messages (Danes et al, 1978). But after a number of messages have been received, the effect of subsequent communication becomes smaller, as each subsequent message can move the average only slightly, even if it is highly discrepant with the held attitude.

It is only a small step to extend the theory to beliefs about the importance of a media issue. If one has little knowledge of the issue from prior media coverage or from personal experience, the media can be expected to have a large effect, both in increasing the importance of the issue in the audience memebers' minds and also in directing the evaluative dimension of attitudes. As knowledge grows, either from media coverage or from direct experience, media effects can be expected to decrease.

This time dependency of media effects relationships becomes important when one attempts to assess the effects of media on audiences (or vice-versa). Since all media effects studies must be operationally defined in terms of media coverage of particular events in particular locations, it is conceivable that the choice of event and the coverage history of that event will determine whether effects are found or are not. Thus both the null hypothesis and the research hypothesis relating coverage variables to audience variables may be true, with the discriminating variable being time. Introducing time into the analysis may go a long way to reconciling conflicting views of the nature of media influence.

Watt and van den Berg (1978) used a time series analysis to discriminate among a number of alternative media effects predicted by various media effects viewpoints. By using time-lagged cross-correlations, they found support for a direct effect of media coverage, some qualified support for an agenda-setting effect, and no support for reverse effects (the "mirror-image of society) or a null effects model. However, their analysis covered only the earlier stages of a community controversy, so the variability of effects due to accumulated audience information about the issue was not addressed.

Using the same data, but extended over a longer period of time, this article will examine the effects of coverage history (i.e., time) on the models of media effects which found support in the data. But first is is necessary to review the general models being tested and the time-domain time-series analysis procedures used.

ALTERNATIVE MEDIA THEORIES

The effects of media can be loosely grouped into five categories. Media theory in each category relies on a different set of postulates to derive specific hypotheses. These are dealt with in more detail in Watt and van den Berg (1978). In the direct effects perspective, media coverage variables produce responses at a later point in time in audiences. The "hypodermic" (Katz, 1963), one-step flow (Rogers, 1973), and observational learning (Bandura, 1969, Liebert, Neale and Davidson, 1973) theories are all examples of direct effects. The media coverage variables may be assertions measured on an evaluative scale, informational statements, etc. Audience response may be attitude or belief change toward the object about which the assertion was made, information gain etc. It is necessary to show that the appropriate media variable <u>preceeds</u> the audience effect variable in time.

Indirect effects is another related perspective, in which media effects are mediated by interpersonal communication (Rogers, 1973). But two- or multi-step flow theories still posit the media as the prime mover and the audience member as the ultimate destination of information and attitude or behavior change. The relationship between media variables and and audience responses over time is identical; only the effectiveness of the communication situation is in question. Interpersonal communication variables must be introduced in this theoretical perspective in order to predict media effectiveness, but the time ordering of the variables is identical to the direct effects perspective. For the purposes of

classification of media theories, indirect effects can be seen as an elaboration of the direct effects perspective.

By reversing the postulated time ordering of the media and audience response variables, it is possible to outline another class of media effects theory, the reverse effects or "mirror of society" category (Bogart, 1969). Here the audience variables such as attitude and salience toward an issue change over time, and the media coverage reflects this fact.

Agenda setting (McCombs and Shaw, 1972) is another class of media effects theory which states that the media affect only the perceived salience or importance of an issue, rather than the attitudinal or evaluative perceptions of the audience. The media variable importance in this class of theory is the prominence of coverage of the issue by the media. This must precede in time a corresponding change in audience salience toward the issue.

Reverse agenda setting is another category of theory which results from changing the time order of the audience and media variables. In this perspective, audience concerns with an issue are later reflected in the prominence of coverage given that issue by the media.

The last general class of theory is the null, or more accurately, the reinforcement effects category. This is sometimes associated with Klapper (1960), although it appears with some regularity in political communication research (e.g. Blumler and McLeod, 1974). The presumption in this class of theory is that because of audience selectivity processes (selective exposure,

attention, and retention), media coverage primarily reinforces already held attitudes. Media coverage variables thus cannot predict audience response in the form of changes in the levels of audience variables which correspond to the messages being transmitted. This gives rise to the "null effects" label.

TIME SERIES ANALYSIS PROCEDURES

Clearly discrimination among these general classes of theory requires that both media and audience data be collected over time. There are two major techniques for this collection: multiple wave and continuous time measurement.

Multiple wave data collection is the most common. With this technique both media variables and audience variables are collected at a relatively small number of time points, usually separated by fairly long time periods. The audience sample may be a panel in which the same audience members are interviewed at each time point, or equivalent samples may be used at each time point. If a panel design is used, cross-lagged correlations are often used to test hypotheses (Chaffee, Ward and Tipton, 1970, Tipton et al, 1975). This procedure can be used to determine time ordering of the variables, and thus can discriminate between direct and reverse effects, and direct and reverse agenda setting. The equivalent samples design relies on aggregate tests of differences in media levels (t-tests, for example) and separate aggregate tests for differences in audience variables. Establishing causal time ordering is more difficult with this procedure (Watt, 1978).

The less used alternative is to collect both media and audience variables at a large number of time points, almost continuously over time duration of a study. Because the number of observations at any single time point is small, there is much more error associated with each time point in this procedure. But because there are a large number of time points, time-domain regression procedures can be used to test hypotheses. The power of these procedures, described below, are at least as high as those of cross-lagged correlation techniques using a small number of time points.

Continuous over-time data collection provides an additional major benefit: the lag between cause and effect can be treated as an empirical question. In a typical two-wave, over time study, the elapsed time between measurements is critical (Heise, 1970). If the time interval is unwisely chosen, hypotheses may be falsely rejected. For example, if the measurement interval is too soon, the effect may not have yet appeared; if it is too late, the effect may have come and gone. With continuous measurement, hypotheses can be tested with differing intervals between causes and effect. One is not constrained by an *a priori* decision about the correct time lag between cause and effect

Another benefit of continuous measurement is worth mention. Some media effects may occur very quickly, within a day or two. Multiple wave studies are virtually impossible to carry out this rapidly, as they require a large number of interviews to gain statistical power. Panel studies are also difficult to carry out

in this short time frame, as test sensitization from the initial wave of interviewing will interfere with results in subsequent waves. Continuous over time measurement avoids these problems by requiring only a small number of observations at any time point, and by not requiring a panel design to determine causal time ordering.

There are a number of analysis procedures which can be used with continuous time data to test different kinds of hypotheses. These range from the fairly simple regression models described here to time domain forecasting models (Box and Jenkins, 1970) and frequency domain analysis for cyclical data (Watt, 1979).

To discriminate among the classes of media effects theory described above, simple time-lagged regression is sufficient (Ostrom, 1978). Standard regression procedures are used to predict subsequent values of some dependent (effect) variable from current values of the independent (cause) variables. For example, if a direct effects model is being tested, and a one-day time lag between cause and effect is assumed, one would attempt to predict tomorrow's audience response from today's media variables. Note that this prediction will take place all along the time series: Day 1's media variables will be used with Day 2's audience variables as one observation, then Day 2's media variables will be used with Day 3's audience variables, etc. This procedure is similar to the pairing of a causitive variable at time 1 with an effect variable at time 2 in a cross-lag panel design. But there is no constraint to a fixed time interval. With continuous

measurement, a two-day lag model can be contrasted with the one day model by simply pairing Day 1's media variables with Day 3's audience variables, Day 2's media variables with Day 4's audience variables, etc. In this way the actual lag between cause and effect can be estimated.

Causal direction can be tested by simply reversing the cause and effect variables in the above analysis. To find evidence for causal direction, one would find a significant relationship when the effect lagged the cause in time, but no relationship when the effect preceeded the cause in time.

METHOD

The research described here will contrast a multiple-wave equivalent samples design with a continuous time series analysis. The theoretical problem is to discriminate among the classes of media effects theories outlined above.

The Setting.

From May 1976 to May 1977, the British-French supersonic transport Concorde operated on a trial basis at Washington D.C.'s Dulles Airport. During this period, the Federal Aviation Administration conducted noise and pollution monitoring studies, as well as public reaction research. There was controversy surrounding the trial period, with some organized opposition groups carrying on court challenges and public protests.

The Media Measures

As part of the public reaction monitoring, media coverage of the Concorde was summarized on a daily basis for the entire trial year. All national TV networks were monitored, along with stories carried in the Washington Post. Local TV stories on the top-rated station WTOP were sampled. Details of the data collection may be found in Watt (1978) and Watt and van den Berg (1978) and will not be repeated here.

Each Concorde story was given a prominence score based on a number of structural and presentation elements. The operational formulae for TV and print prominence are given below. The above references give a detailed justification for these formulae, which space forbids reproducing here. The formula used for television prominence was:

TVPROM= ((TPT-TNS) / TPT) + (DS/150) + (TSG*.5 / DS) + (TFV / DS)

Where TPT is total news program time
TNS is time from beginning of newscast to start of Concorde story
DS is the duration in seconds of the Concorde story
TSG is the time of appearance of stills and graphics during the story
TFV is the time of appearance of film or videotape during the story

The formula used for print prominence was:

$$PRPROM = .1 * SW * ((CW * CI) + (2 * G)) * e^{-\frac{(PG-1) + (NS-1)}{10}}$$

Where SW is the section weight (for newspapers the front section is given a weight of 1.5, other sections 1.0; for magazines a cover story is given a weight of 1.5, and all other stories 1.0)
CW is column width, in inches
CI is length of the story in column inches
G is the area of graphics, cartoons and headlines in square inches
PG is the page number for newspapers, 1 for magazines
NS is the number of sections in the particular issue of a newspaper, and is 1.0 for magazines.

Both prominence formulae were face validated by comparing them to the subjective rank orderings of sample stories done by two judges, and both gave story rankings virtually identical to subjective rankings of story prominence.

Each story was also coded independently by 3-5 judges for assertions. An assertion was defined as a simple declaration of fact or opinion about Concorde. Any sentence spoken or printed might contain one, many, or no assertions, depending upon its structure. Each assertion was classified as belonging to one of 38 categories developed by pilot test. Each assertion was also given an evaluative valence of positive, neutral, or negative. Each story thus received 114 (38 x 3) assertions scores, each of which was the mean of the number of assertions in the particular category-valence combination found by all the coders of the particular story. Overall, percentage agreement on assertions from a sample of stories was 92%, with most categories showing 85-95% agreement reliability values.

Only seven of the assertions categories were used in this research. They were:

Noise: phyiological effects
Noise : measurement by FAA
Noise: measurement by other groups
Noise, measurement, general
Subjective reactions to noise
Concorde noise compared to other planes
Other mentions of Concorde noise

For each of these categories, a potential effects index (called the strength-direction index) was computed. This index was formed by multiplying the story prominence by the algebraic sum of the assertions in each category, then summing over the seven categories to give the single STRDIR value for the story. The operational formula for the index used was:

STRDIR = (NPOS - NNEG) * PROM

where STR-DIR is the strength-direction index for a stody
NPOS is the number of positive assertions in the story
NNEG is the number of negative assertions in the story
PROM is the prominence score of the story

The strength-direction index was used as the media variable for tests of the direct effects and reverse effects theories. The prominence score alone was used as the media variable for agenda setting tests.

The Audience Measure

During the test period, the FAA maintained a telephone noise complaint service. The number of complaints were summarized daily. This variable was used as an operational measure of audience attitude in the direct and reverse effects tests (more complaints

implies a more negative attitude) and salience of the issue in agenda setting tests (more complaints implies a more important issue).

Public Opinion Data

The public opinion data used were provided by the FAA from polls taken before the first Concorde landing (Wave 1) May 17, 1976; and at two times during the test period: December 7-12, 1976 (Wave 2) and May 10-31, 1977 (Wave 3). The total number of persons interviewed for Wave 1 was 2026, for Wave 2 was 1629 and for Wave 3 was 1635.

Opinion items about aircraft noise in the public opinion questionnaires were combined into two indices for comparison with media coverage of Concorde noise-related items. The two indices were called Reported Annoyance with Aircraft Noise (RAAN) and Reported Degree of Interference with Daily Activites (RDIDA).

RAAN Index. This index was derived from four questions about aircraft noise on the questionnaire. Its scoring follows this hierarchy of annoyance:

- did not notice noise of aircraft even when outside
- noticed noise outside
- noticed noise outside and was annoyed by it.
- noticed noise inside and was annoyed by it.

Because levels of annoyance were expressed by respondents in the original questions, the range of this index was actually 0 (not annoyed) to 7 (highly annoyed).

RDIDA Index. This index was constructed from nine answers to a question about the interference with daily activities caused by aircraft noise. A group of 15 judges were asked to rank order the activities according to the seriousness of the disturbance. The mean rank of each activity (summarized below) was used as a weight for the frequency with which the respondents reported interference with the activity. The weighted frequencies were then summed together to give the single value for the RDIDA index. The weights from the ranking procedure were:

a)	Interference with radio/TV	.69
b)	Cause the house to vibrate	.77
c)	Interfere with ordinary conversation	.80
d)	Disturb rest and relaxation	.82
e)	Make it difficult to concentrate	.76
f)	Frighten you	.60
g)	Make you nervous	.64
h)	Make it difficult to fall asleep	.76

Other Variables

Obviously media coverage alone is not sufficient to explain audience response or vice-versa. Other relevant variables affecting the process should be introduced into the analysis for control or explanatory purposes, else they will appear as error variance and possibly obscure true relationships. Two variables were included for this purpose in this study.

The actual measured noise of the Concorde was obtained from FAA monitoring sources. The value used was the effective perceived noise level (EPNL) in decibels, measured approximately three nautical miles from the airport.

The daily temperatures were also obtained. The usefulness of this variable may not be immediately evident, but it has a potential effect on audience response to aircraft noise. During the summer months, people are more likely to be outdoors and thus to be directly exposed to noise and hence more likely to complain. In the winter, exposure to noise is less likely and thus fewer complaints may be received.

RESULTS AND CONCLUSIONS

Multiple Wave Analysis

Tests for changes in the levels of media and public opinion variables are shown in Table I. Both the annoyance and interference indices changed significantly between waves 1 and 2 and later between waves 2 and 3. Both these public reaction indices decreased from wave 1 to wave 2, indicating a less negative opinion toward the Concorde. But from wave 2 to wave 3, the indices increased again, nearly back to their original wave 1 levels.

However, over the same period of time neither of the media coverage variables changed significantly. There were large changes in means between waves 1 and 2 for both story prominence and for the strength-direction (potential effects) index, but the small number of observations in wave 1 did not permit confident statements of difference to be made.

This pattern of results indicates no media effect. Public opinion is changing significantly while media coverage is not. The null effects model would seem to find support in this data. Since

the null model is the choice, any discussion of changes in media effect over time is superfluous; the media have no apparent effect at any time.

Two Equal Time Period Analysis

Since both selection of an appropriate media effects category and analysis of changes in effects over time are of interest, the continuous time analysis was split into two parallel analyses. The first consisted of the 183 time points in the first six months of the Concorde trial period, and the second was the 183 time points making up the last six months of the trial.

Table II indicates that there were no significant differences in the prominence of media coverage of the Concorde or in the weighted assertions (strength-direction index) made about the flight trials. This parallels the finding of the previous three-wave analysis. The Concorde coverage was given an "average" prominence when compared to a sample of non-Concorde stories (Watt, 1978), and this prominence was consistent between the first and second six months. Assertions about the Concorde were somewhat negative in balance in both time periods.

The number of noise complaints made were virtually identical in both time periods. Apparently the significant changes in public reaction to the Concorde did not translate into changes in this behavior.

Only the temperature and actual noise level were significantly different between the first and second six months. This certainly would be expected of the temperature, as the first six months (the

middle of May through the middle of October, 1976) included summer temperatures and the second six (the middle of October through the middle of May, 1977) included the winter temperatures. Although colder, more dense air transmits sound more effectively, Concorde noise dropped significantly between the first and second six months. Apparently pilots learned how to minimize landing and take-off noise as time progressed.

If these data were analyzed as a two-time point study, no conclusions of interest could be drawn. Media coverage did not change nor did the number of complaints. A picture of stasis emerges.

But aggregating a number of observations over time into two categories ("early" and "late" coverage and effects) masks the day-to-day variation in the data. As will be shown below, this is a very good example of choosing the wrong time interval for discrete analysis and being forced into erroneous conclusions as a result.

Continuous Time Analysis

Autocorrelations. These figures, shown in Table III, are simply correlations of a variable with itself at a later period of time. They are useful for determining the stability or predictability of a variable over time. For example, the table indicates that almost two-thirds of the variance in the next day's temperature can be predicted by the current day's temperature, and that about half of the variance of the temperature the day after that can also be predicted. In fact, temperature is very stable, since half the variance in temperature a week later can also be predicted from the current temperature.

In contrast, the prominence of coverage of Concorde is much less predictable. A little less than 10% of the variance in the next day's coverage can be predicted from current coverage, and only 2% of the variance in coverage can be predicted for the day after that. After a three-day lag, current coverage levels do not predict subsequent coverage at better than chance levels.

The potential effects index (Str-Dir Index) is even less stable. Only the subsequent day's values can be predicted from current values.

Noise levels show a peculiar pattern. Current noise levels do not predict the next day's levels, but they do predict those two, seven, and nine days later. This is evidence for a cyclic trend in the noise values. It is probable that these cycles reflect Concorde operations schedules, which repeat on a weekly basis. The two and nine day lags are also one week apart in time, and thus the nine day lag can be considered a reflection of the weekly cycle, also. The two day lag in this hypothetical explanation is probably due to the alternation of British and French airline operations. During the test period the British pilots were generally considered to concern themselves more with reducing noise.

Complaints also show a weekly cycle. Current complaints predict subsequent day complaints, and also those a week later. The seven day cycle is probably due to a "weekend effect", in which more complaints are lodged during the weekends when people are more likely to be home, in the operations path, and are also more likely to be outdoors when landings and take-offs occur. To investigate

some of these effects, the variables were categorized according to the day of the week and an analysis of variance was carried out to determine if there were indeed differences. Table IV contains the results.

The only variables which showed significant differences due to the day of the week on which measurement was taken were the noise levels and the complaints. The noise level was lower on alternate days of the week. An a posteriori Scheffe test produced homogeneous subsets in which Tuesday, Thursday and Saturday noise level were similar (and high) and in which Wednesday, Friday and Sunday noise levels were similarly low. Monday noise levels were intermediate and could be grouped with either subset. Apparently the alternating French/British operations were associated with cycling noise levels.

Complaints showed an apparent weekend effect. The highest number of complaints were telephoned in on Sunday, the second highest on Saturday, and the third highest on Monday. The latter might be a delayed result of noise exposure during the weekend. A Scheffe test grouped these means together, but also indicated that they were not significantly different from Thursday and Friday.

Multiple Cross Correlation Results. Because of the combination of two-day and seven-day cycles observed, it was necessary to investigate independent variables which led and lagged the dependent variables by at least nine days. The analysis was split into two sections: the first regression investigated the reverse effects models in which the media variables (prominence and

strength-direction index) follow the audience variable (complaints), and the control variables of noise and temperature lead complaints in time, since there is no reason to think complaints modify later temperature or noise levels. This analysis produced null results for all media variables, giving no support for reverse direct effects or reverse agenda-setting.

The results of the second analysis for direct effects and agenda-setting are shown in Table V. In this analysis all media and control variables lead the dependent audience variable in time from zero to nine days. All were introduced simultaneously in a regression equation, as was done in the first analysis. Thus the covariance between the independent and control variables was controlled, and furthermore, all covariance between the different lags of the same variable was controlled. Table V shows only the resulting significant F values for the specific lags of the variables.

The data for the first six months of coverage indicate definite media effects taking place. The strength-direction index, which is the evaluative valence of the coverage weighted by the prominence of the coverage, is significantly related in a negative direction to the number of complaints received the next day. In other words, the more negative the coverage, the higher the number of complaints the next day. This is clear evidence for direct, or very rapid indirect effects, of media coverage. The prominence of the coverage, which ignores the evaluative dimension, predicts the number of complaints received two days later at much better than chance levels. This indicates an agenda-setting effect of coverage.

As one would expect, noise levels are also related to the number of complaints received. But the direction of the relationship and its time lags are unexpected. The noise levels three and nine days earlier predict the number of complaints in a negative manner, i.e. as the noise goes up, the number of complaints goes down three days later. There is no satisfying reason why this counter-theoretical finding should be observed. The most likely explanation is a statistical on. Both complaints and noise levels show cycling effects. The linear regression procedure cannot adequately model these repeating non-linearities. The number of complaints is stable for two days, and repeats on a weekly basis. Noise levels also cycle weekly, but reverse on alternate days, giving a positive autocorrelation at a two day lag. The complex interaction of these two cycles may have yielded the negative result with the long time lags.

The second six months' results are striking for their lack of media variables. Only daily temperature predicted the number of complaints, with higher temperatures predicting more complaints the next day, five days later and six days later. The first time lag of one day is plausible. Persons are more likely to be out of doors on warm days, and thus more likely to be exposed to sound. That this exposure is followed by complaints the next day is reasonable. But it is quite probable that the five day prediction is the result of multicollinearity caused by the very high autocorrelations in temperature, as the six day lag beta is almost its negative conjugate. This set of cancelling weights is typical of multicollinear data.

The general conclusions to be drawn from this data are that the media produce short-term direct effects in viewer behavior consistent with their coverage. Prominent coverage also has a short-term agenda-setting effect. However, these effects occur only when the coverage first appears. Later coverage is not related to audience behavior.

DISCUSSION

These analyses have shown clearly how the choice of time lag between variables can affect the conclusions drawn. The multiple wave analysis gave no indication of a media effect on public opinion, and by implication, on audience behavior. The two time period (first and second six months) aggregate analysis indicated no change in either media coverage or audience reaction. But when variables were examined at short time lags, a picture of early media effects followed by null effects emerges.

These findings are consistent with the idea of accumulated information (Saltiel and Woelfel, 1975). During the initial stages of the controversy, the media did lead audience behavior and did set the agenda to some degree. After a relatively large amount of information has been transmitted by the media, subsequent information did not result in any further change in audience behavior.

The media cannot be considered ineffective in determing public reaction in this analysis. An early effect which "ceilings" out due to accumulated information is still an effect, and one which is likely to persist precisely because of the magnitude of the

information transmitted. The lack of relationship between later media coverage and audience behavior merely means that the persons who responded to the somewhat negative media coverage during the initial stage of the controversy by complaining about noise then probably maintained their behavior whether the media coverage was present or not.

It is interesting that the variable which should have been most related to noise complaints (the actual noise level) was not so related in any straightforward manner. This may have been a result of the linear regression procedures used, or it may be that the actual noise level was not a true cause of noise complaints.

The single best predictor of complaints was the outside temperature in the second six months. This indicates the power of rather mundane ecological variables to explain behaviors which would appppear as error variance if these control variables were not included in the analyses. The fact that this explanatory power was over five times as great as the explanatory power of the media variables also gives some perspective to the relative size of media effects in determining audience behavior. But it is critical to remember that 2-5% of a mass audience is a large number, which can very easily be socially significant in addition to being statistically significant.

TABLE I

THREE-WAVE CHANGES IN PUBLIC OPINION AND MEDIA COVERAGE

VARIABLE	WAVE 1 MEAN	WAVE 1 SE	DIFF (1-2)	t	p	WAVE 2 MEAN	WAVE 2 SE	DIFF (2-3)	t	p	WAVE 3 MEAN	WAVE 3 SE
Prominence	30.399	20.399	-30.060	-1.47	.380	.339	.080	.218	.78	.437	.557	.268
STRDIR	-6.056	15.192	5.599	.37	.770	-.457	.309	.069	.15	.880	-.388	.325
RAAN	1.784	.047	-.346	-4.98	.000	1.438	.051	.414	5.57	.000	1.852	.054
RDIDA	2.140	.080	-.381	-3.24	.000	1.759	.086	.516	4.56	.000	2.275	.102

STRDIR is the Strength-Direction (Potential Effects) index
RANN is Reported Annoyance With Aircraft Noise
RDIDA is Reported Degree of Interference with Daily Acivities

TABLE II

CHANGES IN VARIABLES FROM FIRST TO SECOND SIX MONTHS

VARIABLE	FIRST SIX MONTHS MEAN	SE	DIFF	t	p	SECOND SIX MONTHS MEAN	SE
PROMINENCE	.642	.292	.102	.31	.759	.744	.158
STRDIR	-.566	.361	-.014	-.03	.973	-.580	.210
TEMP	69.139	1.059	-20.01	-11.23	.000	49.134	1.433
EPNL	116.03	.438	-2.95	-4.78	.000	113.08	.432
COMPLAIN	3.73	.303	.02	.04	.970	3.75	.307

STRDIR is the Strength-Direction (Potential Effects) index
TEMP is the daily temperature
EPNL is the effective perceived noise level in dB
COMPLAIN is the number of complaints received

Table III

Autocorrelations of Story Prominence, Story Strength-Direction Index, Temperature, Effective Perceived Noise Level, and Noise Complaints.

Time Lag	Prominence	Str-Dir Index	Temperature	EPNL	Complaints
0	1.00	1.00	1.00	1.00	1.00
1	.30****	.25****	.82****	-.01	.20****
2	.14***	-.02	.76****	.20****	.06
3	.04	.04	.75****	.08	-.04
4	.02	-.03	.73****	.10*	-.06
5	.01	-.01	.74****	.10*	.02
6	-.02	-.01	.74****	.02	.10
7	-.02	-.02	.74****	.29****	.22****
8	-.03	-.02	.73****	.01	.14***
9	-.02	-.02	.73****	.12***	-.02

**** indicates $p < .001$

*** indicates $p < .01$

** indicates $p < .02$

* indicates $p < .05$

TABLE IV

DAY OF WEEK DIFFERENCES IN VARIABLES

Variable	Mon	Tue	Wed	Thu	Fri	Sat	Sun	F	Prob
Prominence	.82	1.40	.54	.57	.86	.21	.36	.87	n.s.
Str-Dir	-.15	-.87	-1.46	-.30	-.77	-.09	-.36	.80	n.s.
Temp	58.2	53.3	56.5	62.3	59.4	61.1	60.5	1.13	.34
EPNL	115.8	117.1	111.7	116.6	112.9	117.1	112.3	9.74	.0001
Complaint	4.40	1.64	1.98	4.08	3.81	4.81	5.50	6.95	.0001

TABLE V

Multiple Cross-Correlation Models

TIME PERIOD	VARIABLE	LAG DAYS	BETA WEIGHT	SIMPLE CORRELATION	F (df)	SIG
First	Prominence	2	.25	.15	7.225 (1;181)	.0100
Six	Noise	9	-.21	-.13	5.995 (1;181)	.0156
Months	Noise	3	-.19	-.09	5.446 (1;181)	.0211
	Str-Dir	1	-.17	-.10	4.110 (1;181)	.0446
Second	Temperature	1	.40	.35	4.065 (1;181)	.0458
Six	Temperature	6	-.33	.22	4.996 (1,181)	.0271
Months	Temperature	5	.31	.33	4.297 (1;181)	.0401

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